

REMARKS

Claims 1-39 are currently pending in the application. By this amendment, claim 7 is amended for the Examiner's consideration. The above amendments do not add new matter to the application and are fully supported by the original disclosure. For example, support for the amendments is provided in the claims as originally filed. Reconsideration of the rejected claims in view of the above amendments and the following remarks is respectfully requested.

Claim Objection

Claim 19 was objected to for being an improper Markush claim. This objection is respectfully traversed.

Applicants initially note that the Examiner has failed to explain why the claim is improper.

In any event, claim 19 properly recites alternative features in a manner such that there is no ambiguity as to which alternatives are covered by the claim. MPEP §2173.05(h) explicitly permits the use of alternative recitations if such recitations do not render the claim indefinite or result in undue multiplicity.

Accordingly, Applicants respectfully request that the objection over claim 19 be withdrawn.

35 U.S.C. §112 Rejection

Claim 7 was rejected under 35 U.S.C. §112, 2nd paragraph. This rejection is respectfully traversed.

The Examiner asserted that the term "optionally" used in claim 7 is relative and renders the claim indefinite. By this amendment, claim 7 is amended to recite "...wherein the log of corrections are used to override...". Applicants submit that this language is clear and definite within the meaning of 35 U.S.C. §112, 2nd paragraph.

Accordingly, Applicants respectfully request that the rejection over claim 7 be withdrawn.

35 U.S.C. §101 Rejection

Claims 1-39 were rejected under 35 U.S.C. §101 for being directed to non-statutory subject matter. This rejection is respectfully traversed.

The Examiner asserts that claims 1, 25, 26, 35, and 39 do not produce a useful result because "[t]he instant application lacks specificity...". The Examiner further asserts that claims 1, 25, 26, 35, and 39 do not produce a tangible result because "[t]he instant application has abstract results...". Applicants respectfully disagree.

Applicants note that the Examiner has correctly cited the "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility", published in the Official Gazette dated November 22, 2005 (hereafter referred to as the "Guidelines"), as the current USPTO standard for the examination of applications with respect to subject matter eligibility. The Guidelines provide that

The claimed invention as a whole must be useful and accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. (Guidelines at Section II).

The Guidelines also place the initial burden of demonstrating unpatentability on the Examiner:

The burden is on the USPTO to set forth a *prima facie* case of unpatentability. Therefore if the examiner determines that it is more likely than not that the claimed subject matter falls outside all of the statutory categories, the examiner must provide an explanation. (Guidelines, Section IV).

Applicants initially submit that the Examiner has failed to establish a *prima facie* case of unpatentability with respect to at least independent claim 38 because the Examiner has not provided any explanation as to why claim 38 is considered to be directed to non-statutory subject matter. More particularly, Applicants note that the Examiner is completely silent as to why claim 38 is considered to be directed to non-

statutory subject matter. Therefore, the rejection of claim 38 is improper and should be withdrawn.

Useful Result

As noted above, the claimed invention as a whole must produce a useful, tangible, and concrete result. The guidance for the "useful result" prong of the §101 inquiry is provided by the following passage

For an invention to be "useful" it must satisfy the utility requirement of section 101. The USPTO's official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial and (iii) credible. MPEP Sec. 2107... (Guidelines at Section IV).

Moreover, when evaluating whether a claim meets the requirements of §101, the following passages of the Guidelines mandate that the Examiner consider the claimed invention as a whole:

... when evaluating the scope of a claim, every limitation in the claim must be considered. USPTO personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered. See, e.g., *Diamond v. Diehr*, 450 U.S. 175, 188-89, 209 USPQ 1, 9 (1981). (Guidelines at Section II, emphasis added).

...

In evaluating whether a claim meets the requirements of section 101, the Supreme Court requires that the claim be considered as a whole... (Guidelines at Annex II, Section A, emphasis added).

Applicants submit that, contrary to the mandate of the Guidelines, the Examiner is not considering the claimed invention as a whole, but, rather, is dissecting the claimed invention into discrete elements and then evaluating the elements in isolation. For example, the Examiner asserts that claims 1, 35 and 39 do not produce a useful

result because they contain the limitation "... selectively presenting for review and correction...". The Examiner also asserts that claim 25 does not produce a useful result because it contains the limitation "... any annotation ... is presented for review...". The Examiner further asserts that claim 26 does not produce a useful result because it contains the limitation "... any annotation ... will be presented to the user...". Applicants respectfully disagree and submit that the Examiner is improperly focusing on individual elements of the claims, and not on the claimed invention as a whole.

Applicants contend that the claimed invention as a whole does indeed produce a useful result in that it possesses specific, substantial, and credible utility. The invention generally relates to a system and method that learns from examples how to annotate information from unstructured or semi-structured textual data. All of the independent claims (i.e., claims 1, 25, 26, 35, 38, and 39) recite a method or system for learning annotators, comprising iteratively learning annotators. As will be readily apparent to one of ordinary skill in the art, annotators such as those learned (i.e., created) by the claimed invention can be used for numerous purposes, such as, for example: automatically annotating (e.g., highlighting) search results of text data, and improving the results of machine translations of text data (see pages 2-3 of the specification of the instant application). These uses are specific to the subject matter claimed, are substantial in that they define a real world use, and are credible to one of ordinary skill in the art. Therefore, the claimed invention as a whole does produce a useful result.

Furthermore, the Examiner's attention is directed to MPEP §2107, which provides the following examination guidelines for the utility requirement

Office personnel are to adhere to the following procedures when reviewing patent applications for compliance with the "useful invention" ("utility") requirement of 35 U.S.C. 101 and 112, first paragraph.

(B) Review the claims and the supporting written description to determine if the applicant has asserted for the claimed invention any specific and substantial utility that is credible:

(1) If the applicant has asserted that the claimed invention is useful for any particular practical purpose (i.e., it has a "specific and substantial utility") and

the assertion would be considered credible by a person of ordinary skill in the art, do not impose a rejection based on lack of utility.

Applicants submit that the following passages from pages 7-8 of the specification of the instant application constitute an assertion that the claimed invention is useful for a particular practical purpose:

The invention is directed to a semi-automatic interactive learning system and method for building and training annotators used in electronic messaging systems, text document analysis systems, information retrieval systems and similar systems. ... After one or more iterations, a more reliable automated annotator system is produced for exporting and general use by other applications so that documents may be automatically analyzed using the annotation system to perform further operations on the documents such as, for example, routing or searching of the documents. (emphasis added)

...

... In this manner, the system and method of the invention produces a final set of one or more annotators to be used by a general annotator-applier on arbitrary text input, which determines specific instances of annotations and in addition, assigns confidence levels indicating the likelihood that annotation instances are correct. (emphasis added)

As demonstrated by these passages, Applicants have clearly asserted that the claimed invention is useful for a particular purpose that would be considered credible by a skilled artisan. Therefore, the claimed invention as a whole has a useful result. As such, the Examiner has improperly imposed a rejection based on a lack of utility, and the rejection of claims 1-39 for lack of utility should be withdrawn.

Tangible Result

The guidance for the "tangible result" prong of the §101 inquiry is provided by the following passage from the Guidelines:

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a Sec. 101 judicial exception, in that the process claim must set forth a practical application of that Sec. 101 judicial exception to produce a real-world result. (Guidelines at Section IV).

With respect to the tangible result requirement, Applicants again submit that the Examiner is not considering the claimed invention as a whole, but, rather, is improperly dissecting the claimed invention into discrete elements and then evaluating the elements in isolation. For example, the Examiner asserts that claims 1, 35, and 39 have "abstract results" because of the recitation "selectively presenting for review and correction". Also, the Examiner asserts that claim 25 has an abstract result because of the recitation "iteratively learning". Lastly, the Examiner asserts that claims 26 has an abstract result because of the recitation "will be presented to the user". Applicants respectfully disagree and submit that the Examiner is improperly focusing on individual elements of the claims, and not on the claimed invention as a whole.

Applicants initially submit that the Examiner's explanation fails to establish a *prima facie* case of unpatentability. More particularly, with respect to claims 1, 35, and 39, the Examiner states that "if such representations never leave the processor, there isn't any tangible result". Applicants note that a "processor" is not recited in any of claims 1, 35, and 39. Therefore, the Examiner's explanation is not directed to the claimed invention and fails to establish a *prima facie* case of unpatentability.

In any event, Applicants contend that the claimed invention as a whole does indeed produce a tangible result in that it produces a real world result, as opposed to reciting a mere §101 judicial exception (e.g., abstract ideas, laws of nature, natural phenomena). As discussed above, the invention generally relates to a system and method that learns from examples how to annotate information from unstructured or semi-structured textual data. All of the independent claims (i.e., claims 1, 25, 26, 35, 38, and 39) recite a method or system for learning annotators, comprising iteratively

learning annotators. The real world result is the learned annotator that is created. As discussed above, such an annotator can be used in numerous specific applications, such as, for example, automatically analyzing text data for the purpose of searching or routing of documents. These are clearly a real world (i.e., not abstract) results.

The Examiner, however, is improperly focusing on the individual steps of the how the annotator is created (e.g., iteratively learned, selectively presented for review, will be presented to the user, etc.), and is not considering the final result (i.e., the annotator itself). This is contrary to the language of the Guidelines, which states:

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result is "useful, tangible and concrete." (Guidelines at Section IV and again at Annex II, Section B).

Applicants submit that the claimed invention as a whole does produce a produce a useful, concrete and tangible result for at least the reasons discussed above.

Accordingly, Applicants respectfully request that the rejection over claims 1-39 be withdrawn.

35 U.S.C. §102 Rejection

Claims 1-39 were rejected under 35 U.S.C. §102(e) for being anticipated by U. S. Patent Application Publication No. 2004/0205482 issued to Basu *et al.* ("Basu"). This rejection is respectfully traversed.

To anticipate a claim, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference. MPEP §2131. Applicants submit that Basu does not show each and every feature of the claimed invention.

Independent Claims 1, 35 and 39

The invention generally relates to identifying, demarcating and labeling, i.e., annotating, information in unstructured or semi-structured textual data, and, more particularly, to a system and method that learns from examples how to annotate information from unstructured or semi-structured textual data. The invention is directed to a semi-automatic interactive learning system and method for building and training annotators used in electronic messaging systems, text document analysis systems, information retrieval systems and similar systems. This system and method of the invention reduces the amount of manual labor and level of expertise required to train annotators. In general, the invention provides iteratively built annotators whereby at the end of each iteration, a user provides feedback, effectively correcting the annotations of the system. After one or more iterations, a more reliable automated annotator system is produced for exporting and general use by other applications so that documents may be automatically analyzed using the annotation system to perform further operations on the documents such as, for example, routing or searching of the documents. Claim 1 recites, in pertinent part:

... providing at least partially annotated text data or unannotated text data with seeds or seed models of instances of at least one named entity or class to be learned;
 iteratively learning annotators for the at least one named entity or class using a machine learning algorithm;
 applying the learned annotators to text data resulting in the annotation of at least one named entity or class annotation instance; and ...

Claim 35 recites, in pertinent part:

... a means for providing at least partially annotated text data or unannotated text data with seeds or seed models of instances of at least one named entity or class to be learned;
 a means for iteratively learning annotators for the at least one named entity or class using a machine learning algorithm from the at least one named entity or class;

a means for applying the learned annotators to text data resulting in the annotation of at least one named entity or class annotation instance; and ...

Claim 39 recites, in pertinent part:

... a first computer component to provide at least partially annotated text data or unannotated text data with seeds or seed models of instances of at least one named entity or class to be learned;

a second computer component to iteratively learn annotators for the at least one named entity or class using a machine learning algorithm from the at least one named entity or class;

a third computer component to apply the learned annotators to text data resulting in the annotation of at least one named entity or class annotation instance; and ...

The Examiner is of the opinion that Basu discloses all of these features in the abstract and at paragraph 0036 (see pages 4-5 of the Detailed Action). Applicants respectfully disagree, and submit that Basu does not show each and every feature of the claimed invention.

Basu discloses a method and apparatus for active annotation of multimedia content. The Basu invention is directed toward facilitating the efficient annotation of large volumes of multimedia content such as video databases and image archives (para. 0012). The system actively selects examples to be annotated, accepts annotations for these examples from the user, and propagates and stores the annotations. The propagation and storage then influence the next iteration of active selection of examples (para. 0026). Once a sufficient set of labeled examples is stored, the system can be used to actively annotate large volumes of multimedia content.

The Basu system minimizes the number of examples that a user must annotate by selecting only those examples that are most ambiguous (para. 0028). Annotating the most ambiguous examples results in maximum confidence for the system to propagate the annotations automatically. The ambiguity of any example is measured by deterministic or probabilistic models, which employ a number of different features

representations, such as the color, shape, and texture of images and videos (para. 0029). The representations may be updated interactively and sequentially after each new user interaction to further disambiguate the representation and strengthen the confidence in the propagation (para. 0036).

In a preferred embodiment, Basu discloses annotating video content (see paragraphs 0037 through 0079, and FIGS. 8 through 15). Basu does not, however, describe providing at least partially annotated text data or unannotated text data with seeds or seed models, as recited in the claimed invention. Moreover, Basu does not disclose applying the learned annotators to text data, as recited in the claimed invention. Instead, Basu only describes providing unannotated video data, i.e., the TREC Video Corpus (para. 0037), not partially annotated text data or unannotated text data. Moreover, Basu is completely silent as to seeds or seed models. Lastly, Basu only describes applying annotators to video data (paras. 0037-0079), not to text data. Therefore, Basu does not disclose each and every element of claims 1, 35, and 39, and does not anticipate the claimed invention.

Independent Claims 25 and 38

Claim 25 recites, in pertinent part:

providing examples of a type of a named entity and unannotated textual data; and

iteratively learning annotators based on at least one of the examples of a named entity and unannotated textual data, where at the end of each iteration, any annotation, generated from the learned annotators, having a confidence level within a confidence level range is presented for review and, if required, corrected based on feedback.

Claim 38 recites, in pertinent part:

means for providing examples of a type of a named entity and unannotated textual data; and

means for iteratively learning annotators based on at least one of the examples of a named entity and unannotated textual data, where at the end of each iteration,

any annotation, generated from the learned annotators, having a confidence level within a confidence level range is corrected based on feedback.

The Examiner is of the opinion that Basu discloses all of these features in the abstract and at paragraph 0028 (see pages 10-11 of the Detailed Action). Applicants respectfully disagree, and submit that Basu does not show each and every feature of the claimed invention.

As discussed above, Basu discloses: providing unannotated examples of multimedia content, accepting input annotations from a user for the examples, and propagating the input annotations to other instances of multimedia content. However, Basu does not disclose providing examples of a type of a named entity and unannotated textual data, as recited in the claimed invention. To the contrary, Basu only describes providing unannotated multimedia data, preferably video data, and does not describe providing unannotated textual data. Moreover, Basu does not disclose providing both examples and unannotated data. Instead, Basu discloses that the unannotated data is the example that the user then provides an annotation for.

Lastly, Basu does not disclose that at the end of each iteration, any annotation generated from the learned annotators, having a confidence level within a confidence level range, is corrected based on feedback, as recited in the claimed invention. Instead, Basu discloses that a measure of ambiguity or confidence is used to select which examples of unannotated data to present to the user (paras. 0028, 0038, and 0072). Thus, Basu implicitly discloses measuring the ambiguity (i.e., confidence) of an example of unannotated data, not of a generated annotation, as recited in the claimed invention. Moreover, Basu uses the measure of the ambiguity (i.e., confidence) to select an example for presentation to the user at the beginning of an iteration, not at the end of each iteration, as recited in the claimed invention. Lastly, Basu does not disclose a confidence level within a confidence level range. Basu is completely silent as to a confidence level range. Therefore, Basu does not disclose each and every element of claims 25 and 38 and does not anticipate the claimed invention.

Independent Claim 26

Claim 26 recites, in pertinent part:

... a user sequentially labeling annotation instances in a current document from a document set;
a machine learning algorithm concurrently training on the documents in the document set to learn at least one annotator for at least one named entity or class; and
assigning a confidence level to each of the annotation instances by the learned at least one annotator such that any annotation instance which has a confidence level ...

The Examiner is of the opinion that Basu discloses all of these features in the abstract and at paragraph 0028 (see page 11 of the Detailed Action). Applicants respectfully disagree, and submit that Basu does not show each and every feature of the claimed invention.

As discussed above, Basu discloses: providing unannotated examples of multimedia content, accepting input annotations from a user for the examples, and propagating the input annotations to other instances of multimedia content. Basu does not disclose a current document and document set, as recited in claim 26. Instead, Basu describes a single video document (i.e., the TREC Video Corpus) on which the user provides annotations and the system concurrently trains.

Furthermore, Basu does not disclose assigning a confidence level to each annotation instance. Instead, the Basu system suggests examples to be annotated based on an ambiguity measurement of the example itself. The annotations are then verified (accepted or rejected) by the user, and accepted annotations are stored and propagated (paras. 0028 and 0034). Thus, in Basu, the only quantitative measure of ambiguity or confidence is provided for the example of unannotated data itself, and not for the annotation instance. However, this is not the same as assigning a confidence level to each annotation instance. Therefore, Basu does not contain all of the features of claim 26 and does not anticipate the claimed invention.

Dependent Claims

Applicants respectfully submit that dependent claims 2-24, 27-34, 36 and 37 depend from an allowable independent claim, and are allowable by virtue of the allowability of the respective independent claim.

Moreover, the applied references do not teach or suggest many of the features of the dependent claims. For example, Basu does not disclose preprocessing groups of words or phrases into single units before the iteratively learning step, as recited in claim 8. Even assuming *arguendo* that disambiguating requires preprocessing (as asserted by the Examiner), which Applicants do not agree with or concede, Basu still does not disclose preprocessing groups of words or phrases into single units.

Furthermore, Basu does not disclose that if confidence levels do not fall within a closed interval then a transformation will be applied to map a confidence level range onto the closed interval $[0 \dots 1]$ for purposes of presentation to the user, as recited in claim 10. Contrary to the Examiner's assertion, Basu simply makes no mention of applying a transformation to map a confidence level onto the closed interval of $[0 \dots 1]$.

Even further, Basu does not disclose that bins allows a user to inspect some examples and choose to accept or reject all instances in that bin, as recited in claim 16. To the contrary, Basu only describes that the user verifies each annotation instance singularly, and makes no mention whatsoever of bins of annotation instances and of accepting or rejecting all instances in a bin.

Additionally, Basu does not disclose that confidence levels associated with each of the annotation instances are generated using the Generalized Winnow learning algorithm, as recited in claim 22. Regardless of whether or not the Generalized Winnow learning algorithm is a probabilistic value, as asserted by the Examiner but which Applicants do not concede, Basu does not disclose using the Generalized Winnow learning algorithm.

Accordingly, Applicants respectfully request that the rejection over claims 1-39 be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-0510.

Respectfully submitted,
David JOHNSON

A handwritten signature in black ink, appearing to read 'Andrew M. Calderon', is written over a horizontal line.

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